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UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Ilias Manettas et al.
Application Number:	10/550,218
Filing Date:	09/19/2005
Group Art Unit:	3742
Examiner:	Stephen J. Ralis
Title:	METHOD FOR POWER REGULATION OF A DEFROSTER HEATER AND REFRIGERATION DEVICE WITH INTEGRATED DEFROSTER HEATING

Mail Stop Appeal Brief - Patents

Commissioner for Patents

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APPEAL BRIEF

Pursuant to 37 CFR 1.192, Appellants hereby file an appeal brief in the above-identified application. This Appeal Brief is accompanied by the requisite fee set forth in 37 CFR 1.17(f).

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(1) REAL PARTY IN INTEREST

The real party in interest is BSH Bosch und Siemens Hausgeräte GmbH.

(2) RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) STATUS OF CLAIMS

Claims 12-26 are pending in the present application. Claims 1-11 were canceled. The final rejections of claims 12-26 are being appealed. Claims 12 and 19 are independent.

(4) STATUS OF AMENDMENTS

There are no outstanding Amendments. The Amendment filed on November 17, 2009, was entered by the Advisory Action dated December 2, 2009.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

An exemplary embodiment of the present invention, as recited by, for example, independent claim 12, is directed to a method for operating a defroster heater (e.g., 8) that defrosts an evaporator (e.g., 7) of a refrigeration device (e.g., Fig. 2), comprising:

recording a voltage amplitude of a supply voltage for the defroster heater (e.g., 8)(e.g., see page 2, lines 30-31);

generating a pulsed supply current for said defroster heater, a pulse-duty ratio of the pulsed supply current based upon said recorded voltage amplitude (e.g., see page 2, lines 32-33); and

supplying said defroster heater (e.g., 8) with said pulsed supply current, for a fixed heating interval (e.g., see page 2, lines 35-36).

An exemplary embodiment of the present invention, as recited by, for example, claim 13, recites that the method further comprises generating said pulse-duty ratio as a decreasing step function of said recorded voltage amplitude (e.g., see page 3, lines 21-25).

An exemplary embodiment of the present invention, as recited by, for example, claim 14, recites that the method further comprises forming at least two discrete values for said decreasing step function in a predetermined permissible range of fluctuation of said voltage amplitude (e.g., see page 3, lines 27-34).

An exemplary embodiment of the present invention, as recited by, for example, claim 15, recites that the method further comprises dividing a value range of said voltage amplitude into a plurality of intervals, for each interval of the plurality of intervals assigning a fixed pulse-duty ratio and providing a ratio of upper to lower limit of said each interval of between 1.1 and 1.2 (e.g., see page 4, lines 1-8).

An exemplary embodiment of the present invention, as recited by, for example, claim 16, recites that the method further comprises assigning a pulse-duty ratio of 1 to a voltage amplitude below at least 150 VAC (e.g., see page 4, lines 14-16).

An exemplary embodiment of the present invention, as recited by, for example, claim 17, recites that the method further comprises assigning a pulse-duty ratio of 1 to a voltage amplitude below at least 165 VAC (e.g., see page 4, lines 14-17).

An exemplary embodiment of the present invention, as recited by, for example, claim 18, recites wherein the fixed heating interval includes a substantial number of cycles of an alternating current provided by the voltage supply (e.g., see page 7, lines 28-29; page 8, lines 20-26).

An exemplary embodiment of the present invention, as recited by, for example, independent claim 19, is directed to a refrigeration device, comprising:

an integrated defroster heater (e.g., 8) for defrosting an evaporator (e.g., 7) (see, e.g., page 5 , lines 6-9);

a voltage supply (e.g., 11) coupled to said defroster heater (e.g., 8)(e.g., see page 5 , lines 13-16);

a recording circuit (e.g., 12) coupled to said voltage supply for recording a voltage amplitude supplied to said defroster heater (e.g., 8) and for generating a control signal having a pulse-duty ratio that is based upon the recorded voltage amplitude (e.g., see page 6, lines 5-19); and

a circuit breaker (e.g., 9) activated by said control signal for pulsing a supply current fed to said defroster heater (e.g., 8) for a fixed heating interval (e.g., see page 5, lines 11-13).

An exemplary embodiment of the present invention, as recited by, for example, claim 20, recites wherein said pulse-duty ratio is generated as a decreasing step function of said recorded voltage amplitude (e.g., see page 5, lines 21-34).

An exemplary embodiment of the present invention, as recited by, for example, claim 21, recites wherein said step function has at least two discrete values (e.g., see page 3, lines 27-34).

An exemplary embodiment of the present invention, as recited by, for example, claim 22, recites wherein said decreasing step function has three or more discrete values (e.g., see page 3, lines 27-34).

An exemplary embodiment of the present invention, as recited by, for example, claim 23, recites wherein a value range of said voltage amplitude is divided into a plurality of intervals, each interval of the plurality of intervals has a fixed pulse-duty ratio assigned, and the ratio from upper to lower limit of said each interval is between 1.1 and 1.2 (e.g., see page 4, lines 1-8).

An exemplary embodiment of the present invention, as recited by, for example, claim 24, recites wherein said recording circuit assigns a voltage amplitude below 150 VAC a pulse-duty ratio of 1 (e.g., see page 4, lines 14-16).

An exemplary embodiment of the present invention, as recited by, for example, claim 25, recites wherein said recording circuit assigns a voltage amplitude below 165 VAC a pulse-duty ratio of 1 (e.g., see page 4, lines 14-17).

An exemplary embodiment of the present invention, as recited by, for example, claim 26, recites wherein the fixed heating interval includes a substantial number of cycles of an alternating current provided by the voltage supply (e.g., 11)(e.g., see page 7, lines 28-29; page 8, lines 20-26).

To summarize, it is known that ice may form on an evaporator of a refrigerator. This ice has an insulating effect, so that exchange of cold between the evaporator and the cooling chamber is made difficult. For this reason, the ice must be thawed from time to time, for which purpose many refrigeration appliances, in particular so-called frost-free appliances, have defroster heating. See, e.g., page 1, lines 10-17.

Conventionally, such defroster heating is controlled, for example, by ice sensors such that the defrosting process is performed if a recorded quantity of ice exceeds a limit value, and discontinued if no more ice is detected. However, such ice sensors may be expensive and insufficiently reliable. Also, a large number of ice sensors may be necessary to reliably assess the total quantity of ice since the thickness of the ice can vary from place to place. Some conventional devices periodically control defrosting procedures with a fixed preset duration with the assistance of a time switch element, which generally is easy, cost-effective, and reliable. See, e.g., page 1, lines 19-31.

Furthermore, in conventional devices, either too much or too little heat supplied wherein there are fluctuations in voltage, since the heat output varies in proportion to the square of the supply voltage of the defroster heating. If there is too little heat, the defrosting procedure is often incomplete. On the other hand, if there is more heat than is actually

necessary for defrosting, then the device causes unnecessary energy consumption. See, e.g., page 2, lines 5-18.

In stark contrast to the conventional devices, the present invention controls a defrost heater with a pulsed supply current having a pulse-duty ratio that is based upon an amplitude of the defroster heater supply voltage. In this manner, the performance of the defroster heater may be appropriately adjusted in response to variances in the supply voltage. The present invention avoids too much or too little heat being supplied, thereby reducing unnecessary energy consumption. See, e.g., page 3, lines 11-25.

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

a. Whether claims 12-26 fail to comply with the written description requirement under 35 U.S.C. 112, first paragraph.

b. Whether claims 13-17 and 20-23 are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention under 35 U.S.C. 112, second paragraph.

c. Whether claims 12, 18, 19, and 26 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over the Zangari et al. reference (U.S. Publication No. 2003/0033822) in view of the Chodacki et al. reference (U.S. Publication No. 2003/0164368).

d. Whether claims 13-17 and 20-25 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over the Zangari et al. reference, the Chodacki et al. reference, and further in view of the Hickl et al. reference (U.S. Patent No. 5,416,300).

(7) ARGUMENT

a. Claims 12-26 comply with the written description requirement under 35 U.S.C. § 112, first paragraph, and do not add new matter.

Claims 12-26 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Appellants respectfully traverse this rejection.

The Office Action states that the Examiner can find no disclosure utilizing a "voltage amplitude" of a supply voltage as well as values being determined based on a voltage amplitude. The Office Action states that the Examiner can "only find disclosure to the 'voltage value' being used. Therefore, the recitation to 'a voltage amplitude' is deemed new matter."

M.P.E.P. § 2163.02 sets out the standard for complying with the written description requirement of 35 U.S.C. § 112, first paragraph:

> "An objective standard for determining compliance with the written description requirement is, "**does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed**. [...] to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed."
>
> Whenever the issue arises, **the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed**. [...] An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as **words, structures, figures, diagrams, and formulas** that fully set forth the claimed invention. [...]

The subject matter of the claim need not be described literally (i.e., using the same terms or in haec verba) in order for the disclosure to satisfy the description requirement.

Emphasis added.

Appellants respectfully submit that the original disclosure and figures convey with reasonable clarity to those skilled in the art that the features of claims 12-26 were in possession of the Appellants, as of the filing date. The features of claims 12-26 very clearly are supported by the original disclosure and therefore do not constitute new matter.

In the Response to Arguments at pages 10-11, numbered paragraph 17, the final Office Action dated August 27, 2009, asserts that "the specification only discloses a "voltage value" being used as basis for generating a pulsed supply current to the defroster heater. A "voltage value" of a "150 VAC" or "165 VAC" ***can be a frequency, period or even magnitude.*** However, there is no specific disclosure to the voltage value of a VAC signal being the voltage amplitude and it would not be obvious to one of ordinary skill in the art to make such an assertion without specific disclosure thereto. Therefore, the 35 U.S.C. 112, first paragraph, new matter rejection is maintained." Emphasis added.

Additionally, the Advisory Action dated December 2, 2009, states that:

> With respect to applicant's reply/argument that "a voltage amplitude" is not deemed new matter due to the original disclosure being "a voltage value", the examiner respectfully disagrees. The examiner, incorporates by reference, the "Remarks" section previously addressing such an argument. The examiner reiterates for the record that "a voltage value" is a broad limitation, whereas "a voltage amplitude" is a narrow limitation. In addition, the examiner can find no support in the original disclosure to being limited to "a voltage amplitude". Therefore, the rejection stands.

Emphasis added Appellants.

Contrary to these assertions in the Office Action and the Advisory Action, Appellants respectfully submit that **the original disclosure and figures** convey with reasonable clarity to those skilled in the art that the features of claims 12-26 were in possession of the Appellants, as of the filing date. The features of claims 12-26 very clearly are supported by the original disclosure and therefore do not constitute new matter.

One of ordinary skill in the art would know and understand that the voltage value being referenced in the present application is the voltage amplitude or voltage magnitude of the supply voltage signal. Indeed, the Office Action itself explicitly acknowledges that "[a] "voltage value" of a "150 VAC" or "165 VAC" *can be a frequency, period* ***or even magnitude***." See Office Action dated August 27, 2009, at page 11, lines 3-4.

Figure 3 shows the results of the example illustrated in the Table on page 5, lines 26-34, of the present application. See also, e.g., page 6, lines 21-22. The voltage alternating current (VAC) values shown in the Table, and correspondingly in Figure 3, very clearly are the amplitude or magnitude of the supply voltage signal, not the frequency or period of the voltage, and would be understood to be the amplitude or magnitude of the supply voltage signal by persons of ordinary skill in the art.

With reference also to Figure 1, the disclosure clearly explains that the control circuit 10 receives a voltage-measuring signal from a voltage meter circuit 12 connected parallel to the clamps 11. See, e.g., page 5, lines 19-24. With reference to Figure 2, the disclosure clearly explains that, to make the acquisition outcome of the measurement circuit 12 independent of the pulse-duty ratio of the circuit breakers 9, the measurement circuit 12 is connected to a diode 13 in series and to a condenser 14 in parallel, the result of which is that the peak value of one of the two half waves of the supply voltage rests constant on the voltage meter circuit 12. See, e.g., page 6, lines 12-19.

One of ordinary skill in the art would know and understand that the volts alternating current (VAC), voltage value, or the peak value being referenced in the present application is the voltage amplitude or voltage magnitude of the supply voltage signal. Indeed, the volts

alternating current (VAC) shown in the Table and Figure 3 very clearly are the amplitude or magnitude of the voltage signal.

Appellants respectfully submit that the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, Appellant was in possession of the invention as now claimed.

Moreover, contrary to the assertions in the Advisory Action, the Amendment filed on November 17, 2009, clearly pointed out that the voltage alternating current (VAC) values shown in the Table, and correspondingly in Figure 3, very clearly are the amplitude or magnitude of the supply voltage signal.

For at least these reasons, claims 12-26 clearly are supported by the original disclosure, and therefore, certainly comply with the written description requirement.

Appellants respectfully request reversal of this rejection.

b. Claims 13-17 and 20-23 are not indefinite under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claims 13-17 and 20-23 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Appellants respectfully traverse this rejection.

The Office Action asserts that claims 13 and 20 recite the limitation "generating said pulse-duty ratio as a decreasing step function of said recorded amplitude voltage" and variations thereof. The Office Action alleges that it is unclear and uncertain to the examiner to what exact a "decreasing step function of the said recorded voltage amplitude" is and how it correlates to the generation of "said pulse-duty ratio. Therefore, the Office Action alleges that

the recitation to limitation "generating said pulse-duty ratio as a decreasing step function of said recorded amplitude voltage" is deemed indefinite and further clarification is required.

Contrary to the assertions in the Office Action, Appellants respectfully submit that claims 13 and 20 set out and circumscribe the particular subject matter with a reasonable degree of clarity and particularity such that one possessing the ordinary level of skill in the pertinent art at the time the invention was made would know and understand the subject matter of the claimed invention.

M.P.E.P. § 2173.02 sets out the standard for complying with 35 U.S.C. § 112, second paragraph:

> The essential inquiry pertaining to the requirement under 35 U.S.C. § 112, second paragraph, is 'whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of: (A) the content of the particular application disclosure; (B) the teachings of the prior art; and (C) the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.'

Claim 13 recites generating said pulse-duty ratio as a decreasing step function of said recorded voltage amplitude. Claim 20 recites wherein said pulse-duty ratio is generated as a decreasing step function of said recorded voltage amplitude.

The specification very clearly explains that the use of a step function corresponds to dividing the value range of the supply voltage into several intervals, whereby each interval is assigned one of the discrete values of the step function. To keep the width of fluctuation of the heat output in each interval approximately identical, the interval limits are preferably fixed such that upper and lower limit are in a ratio substantially the same for all intervals, preferably with a value between 1.1 and 1.2. See, e.g., page 3, lines 27-30; and page 4, lines 1-8.

In the Response to Arguments at page 11, numbered paragraph 18, the Office Action asserts that:

> Applicant recites "further comprising generating said pulse-duty ratio as a decreasing step function of said recorded voltage amplitude." In examining Figure 2, the step function looks to be increasing not decreasing. Further clarification is required to define the orientation of the step function so that one of ordinary skill in the art would ascertain the step function is decreasing instead of increasing.

The Advisory Action dated December 2, 2009, states that:

> With respect to the applicant's reply/argument to the 35 U.S.C. 112, second paragraph, rejection, the examiner respectfully disagrees. The examiner specifically asserted to applicant it is unclear and uncertain to the examiner to what exact a "decreasing step function of the said recorded voltage amplitude" is and how it correlates to the generation of said pulse-duty ratio" (previous Office action, paragraph 11). The examiner asserts that Figure 3 discloses increasing/ramp step functions that step down after a certain increment not decreasing step functions. Therefore, the examiner still maintains the 35 U.S.C. 112, second paragraph, rejection and queries applicant again to what exactly "a decreasing step function" is in light of Figure 3 and the claims as currently recited.

First, Appellants believe that the Office Action is referring to Figure 3, not Figure 2. The Advisory Action appears to confirm this by referring to Figure 3.

Second, claims 13 and 20 clearly recite a decreasing step function. As explained above, Figure 3 shows the results of the example illustrated in the Table on page 5, lines 26-34, of the present application. See also, e.g., page 6, lines 21-22. Appellants respectfully submit that the illustrative embodiment of the Table and Figure 3 clearly shows that the duty cycle decreases for each range of VAC.

For at least these reasons, claims 13 and 20 set out and circumscribe the particular subject matter with a reasonable degree of clarity and particularity such that one possessing the ordinary level of skill in the pertinent art at the time the invention was made would know and understand the subject matter of the claimed invention.

Additionally, in the Response to Arguments at page 11, numbered paragraph 18, the Office Action further asserts that:

> In addition, the preceding claims (12 and 19), recite a "generating a pulse-duty ratio" step and it is unclear and indefinite to how many generations of a pulse-duty ratio for a pulsed supplied current are occurring.

Appellants respectfully traverse this rejection.

Claims 12 and 19 recite the transitional term "comprising", which is inclusive or open-ended and does not exclude additional, un-recited elements or method steps. Claims 12 and 19 clearly recite a method comprising a step of generating a pulse-duty ratio, and therefore, are not limited to a particular number of generating steps and clearly should not be interpreted as being so limited.

Moreover, Appellants respectfully submit that the Office Action does not provide any reason that the number of generations of a pulse-duty ratio allegedly renders these claims indefinite.

For at least these reasons, claims 13 and 20 set out and circumscribe the particular subject matter with a reasonable degree of clarity and particularity such that one possessing the ordinary level of skill in the pertinent art at the time the invention was made would know and understand the subject matter of the claimed invention.

Appellants respectfully request reversal of this rejection.

c. Claims 12, 18, 19, and 26 are patentable under 35 U.S.C. § 103(a) over the Zangari et al. reference (U.S. Publication No. 2003/0033822) and the Chodacki et al. reference (U.S. Publication No. 2003/0164368).

Claims 12, 18, 19, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Zangari et al. reference in view of the Chodacki et al. reference.

Appellants respectfully traverse this rejection.

Appellants respectfully submit that none of the applied references discloses or suggests the features of the claimed invention a method for operating a defroster heater that defrosts an evaporator of a refrigeration device. The method includes recording a voltage amplitude of a supply voltage for the defroster heater, generating a pulsed supply current for the defroster heater, a pulse-duty ratio of the pulsed supply current based upon the recorded voltage amplitude, and supplying the defroster heater with the pulsed supply current, for a fixed heating interval, as recited in independent claim 12.

Appellants respectfully submit that none of the applied references discloses or suggests the features of the claimed invention including a refrigeration device, comprising an integrated defroster heater for defrosting an evaporator, a voltage supply coupled to said defroster heater, a recording circuit coupled to said voltage supply for recording a voltage amplitude supplied to said defroster heater and for generating a control signal having a pulse-duty ratio that is based upon the recorded voltage amplitude, and a circuit breaker activated by said control signal for pulsing a supply current fed to said defroster heater for a fixed heating interval, as recited in independent claim 19.

As explained above, these features are important for controlling a defrost heater with a pulsed supply current having a pulse-duty ratio that is based upon an amplitude of the defroster heater supply voltage. In this manner, the performance of the defroster heater may be appropriately adjusted in response to variances in the supply voltage. The present

invention avoids too much or too little heat being supplied, thereby reducing unnecessary energy consumption.

The Zangari et al. reference very clearly does not teach or suggest these features. Indeed, the Office Action specifically acknowledges that the Zangari et al. reference lacks the teaching of generating a pulsed supply current for the defroster heater, a pulse-duty ratio of the pulsed supply current based upon the recorded voltage amplitude, as recited in claim 12, or that the fixed heating interval includes a substantial number of cycles of an alternating current provided by the voltage supply, as recited in claim 18.

The Chodacki et al. reference does not remedy the deficiencies of the Zangari et al. reference.

Appellants respectfully submit that one of ordinary skill in the art would not have combined the Zangari et al. reference and the Chodacki et al. reference as alleged by the Office Action. Indeed, the Examiner may not rely upon the Chodacki et al. reference under 35 U.S.C. § 103 because the Chodacki et al. reference is non-analogous art.

To qualify as analogous art, a reference must either be (1) within the field of Applicants endeavor, or if not, (2) the subject matter logically would have commended itself to an inventor's attention in considering his or her invention as a whole. See M.P.E.P. § 2141.01(a)(I) citing KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1397 (2007).

In the present instance, the Chodacki et al. reference clearly is not within the field of Applicants' endeavor.

The field of Applicants' endeavor is the field of refrigeration devices and, more particularly, a defroster heater that defrosts an evaporator of a refrigeration device. Indeed, the claims very clearly are directed to a "method for operating a defroster heater that defrosts an evaporator of a refrigeration device" and a "refrigeration device."

In stark contrast, the Chodacki et al. reference is within the completely different and unrelated field of electrical resistance igniters for initiating combustion of a fuel air mixture in

a cooking range, clothes dryer, heating apparatus, etc. supplied with propane, natural gas, or oil. See para. [0001], [0002], and [0045]-[0048].

The field of endeavor of electrical resistance igniters for initiating combustion of a fuel air mixture clearly is different from the field of endeavor of refrigeration devices and, more particularly, a defroster heater that defrosts an evaporator of a refrigeration device.

For at least the foregoing reasons, the Chodacki et al. reference clearly is not within the field of Applicants' endeavor.

As set forth above, a reference that is not within the field of Applicants endeavor may qualify as analogous art if the subject matter logically would have commended itself to an inventor's attention in considering his or her invention as a whole. See M.P.E.P. § 2141.01(a)(I) citing KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1397 (2007).

In the present instance, the subject matter of the Chodacki et al. reference logically would not have commended itself to an inventor's attention in considering his or her invention as a whole.

Properly considered as a whole, the present invention is directed to a defroster heater that defrosts an evaporator of a refrigeration device that avoids too much or too little heat being supplied, thereby reducing unnecessary energy consumption. See, e.g., page 2, lines 5-18, and page 3, lines 11-25.

In stark contrast, the Chodacki et al. reference very clearly is concerned with the completely unrelated problem of providing an igniter control system 10 that yields a control system that allows a hot surface igniter 20 to be heated up more quickly and thus shorten the ignition time for the heating device or apparatus. This control system, after a predetermined time period has expired, also reduces and regulates the voltage being applied thereafter so the hot surface igniter maintains a fairly consistent operating temperature and so as to not unduly shorten the operational life of the hot surface igniter(s). In further embodiments, the methodology for regulating the voltage also yields a method that provides the least amount of

electrical emissions, such that a line filter may not be provided, thereby reducing hardware requirements as well as associated costs such as for manufacturing. See, e.g., para. [0043].

The subject matter of providing a surface igniter 20 that heats up more quickly and thus shortens the ignition time for the heating device or apparatus according to the Chodacki et al. reference logically would not have commended itself to an inventor's attention in considering, as a whole, ways to provide a defroster heater that defrosts an evaporator of a refrigeration device that avoids too much or too little heat being supplied, thereby reducing unnecessary energy consumption. Indeed, the Chodacki et al. reference has absolutely nothing to do with solving the problem of reducing unnecessary energy consumption for a defroster heater that defrosts an evaporator of a refrigeration device, as in the present invention as a whole.

The surface igniter of the Chodacki et al. reference does not address any need or problem known in the field of defroster heaters, and indeed, clearly would not have commended itself to the attention of the ordinarily skilled artisan looking to solve problems with defroster heaters. Rather, the Chodacki et al. reference very clearly is concerned with the completely unrelated problem of providing a surface igniter that heats up more quickly and thus shortens the ignition time for the heating device or apparatus.

For at least these reasons, the subject matter of the Chodacki et al. reference logically would not have commended itself to an inventor's attention in considering his or her invention as a whole, and therefore, the Chodacki et al. reference does not qualify as analogous art.

Even assuming *arguendo*, that the Chodacki et al. reference would qualify as analogous art, Appellants respectfully submit that one of ordinary skill in the art would not have had an apparent reason to combine the disclosure of the Chodacki et al. reference with disclosure of the Zangari et al. reference to arrive at the claimed invention as a whole. Moreover, the Office Action does not establish an adequate rationale for making such a combination.

The Zangari et al. reference is concerned with providing a frosting cooler that creates and maintains frost on cold products, thereby to provide a visual manifestation of the cold condition of the beverage. See Abstract.

In stark contrast, the Chodacki et al. reference is concerned with the completely different and unrelated problem of providing a surface igniter that heats up more quickly and thus shortens the ignition time for the heating device or apparatus.

One of ordinary skill in the art would not have had an apparent reason to combine the features of a surface igniter that heats up more quickly and thus shortens the ignition time for the heating device or apparatus, as taught by the Chodacki et al. reference, with a frosting cooler that creates and maintains frost on cold products, thereby to provide a visual manifestation of the cold condition of the beverage, as taught by the Zangari et al. reference.

Appellants respectfully submit that none of the applied references discloses or suggests the features of the claimed invention including a method for operating a defroster heater that defrosts an evaporator of a refrigeration device. The method includes recording a voltage amplitude of a supply voltage for the defroster heater, generating a pulsed supply current for the defroster heater, a pulse-duty ratio of the pulsed supply current based upon the recorded voltage amplitude, and supplying the defroster heater with the pulsed supply current, for a fixed heating interval, as recited in independent claim 12.

Appellants also respectfully submit that none of the applied references discloses or suggests the features of the claimed invention including a refrigeration device, comprising an integrated defroster heater for defrosting an evaporator, a voltage supply coupled to said defroster heater, a recording circuit coupled to said voltage supply for recording a voltage amplitude supplied to said defroster heater and for generating a control signal having a pulse-duty ratio that is based upon the recorded voltage amplitude, and a circuit breaker activated by said control signal for pulsing a supply current fed to said defroster heater for a fixed heating interval, as recited in independent claim 19.

As explained above, these features are important for controlling a defrost heater with a pulsed supply current having a pulse-duty ratio that is based upon an amplitude of the defroster heater supply voltage. In this manner, the performance of the defroster heater may be appropriately adjusted in response to variances in the supply voltage. The present invention avoids too much or too little heat being supplied, thereby reducing unnecessary energy consumption.

Appellants respectfully request reversal of this rejection.

d. Claims 13-17 and 20-25 are patentable under 35 U.S.C. § 103(a) over the Zangari et al. reference, the Chodacki et al. reference, and the Hickl et al. reference (U.S. Patent No. 5,416,300).

Claims 13-17 and 20-25 rejected under 35 U.S.C. § 103(a) as being unpatentable over the Zangari et al. reference, the Chodacki et al. reference, and further in view of the Hickl et al. reference.

Appellants respectfully traverse this rejection.

The Chodacki et al. reference does not remedy the deficiencies of the Zangari et al. reference and the Chodacki et al. reference with respect to independent claims 12 and 19 above.

Appellants respectfully submit that one of ordinary skill in the art would not have combined the Zangari et al. reference, the Chodacki et al. reference, and the Hickl et al. reference as alleged by the Office Action. Indeed, as with the Chodacki et al. reference, the Examiner may not rely upon the Hickl et al. reference under 35 U.S.C. § 103 because the Hickl et al. reference is non-analogous art.

In the present instance, the Hickl et al. reference clearly is not within the field of Applicants' endeavor. As explained above, the field of Applicants' endeavor is the field of refrigeration devices and, more particularly, a defroster heater that defrosts an evaporator of a

refrigeration device. Indeed, the claims very clearly are directed to a "method for operating a defroster heater that defrosts an evaporator of a refrigeration device" and a "refrigeration device."

In stark contrast, the Hickl et al. reference is within the completely different and unrelated field of electric igniters for initiating combustion of a fuel air mixture in a burner which produces heat in heating system that uses gas, and particularly to an electric igniter for both a 120 V system and a 230 V system. See col. 1, lines 9-32 and 64-68, and col. 2, lines 1-2.

The field of endeavor of electric igniters for initiating combustion of a fuel air mixture in a burner for both a 120 V system and a 230 V system clearly is different from the field of endeavor of refrigeration devices and, more particularly, a defroster heater that defrosts an evaporator of a refrigeration device.

For at least the foregoing reasons, the Hickl et al. reference clearly is not within the field of Applicants' endeavor.

Moreover, the subject matter of the Hickl et al. reference logically would not have commended itself to an inventor's attention in considering his or her invention as a whole.

As explained above, properly considered as a whole, the present invention is directed to a defroster heater that defrosts an evaporator of a refrigeration device that avoids too much or too little heat being supplied, thereby reducing unnecessary energy consumption. See, e.g., page 2, lines 5-18, and page 3, lines 11-25.

In stark contrast, the Hickl et al. reference very clearly is concerned with the completely unrelated problem of providing an electric igniter for initiating combustion of a fuel air mixture in a burner for both a 120 V system and a 230 V system.

The subject matter of providing an electric igniter for both a 120 V system and a 230 V system according to the Hickl et al. reference logically would not have commended itself to an inventor's attention in considering, as a whole, ways to provide a defroster heater that defrosts an evaporator of a refrigeration device that avoids too much or too little heat being

supplied, thereby reducing unnecessary energy consumption. The Hickl et al. reference has absolutely nothing to do with solving the problem of reducing unnecessary energy consumption for a defroster heater that defrosts an evaporator of a refrigeration device, as in the present invention as a whole.

In the Response to Arguments on pages 14-15, the Office Action further alleges that "Hickl et al. teach a keying ratio varying technique to provide a "stabilization of the power output converted at the heater (electric igniter 1) because the heating time... remains nearly constant even with great changes in voltage" (column 3, lines 47-64; column 8, claim 4)." The Office Action asserts that "Hickl et al. is concerned with maintaining the heating time of the heater relatively constant to maintain an operating temperature with respect to the supply voltage and one of ordinary skill in the art would look to others faced with maintaining the heating time of the heater relatively constant to maintain an operating temperature with respect to the supply voltage (see MPEP 2141.01a). Therefore, the examiner deems Hickl et al. as analogous and the rejection as set forth previously and above is maintained."

Contrary to the assertions in the Office Action, Appellants respectfully submit that the subject matter of providing an electric igniter for initiating combustion of a fuel air mixture in a burner for both a 120 V system and a 230 V system according to the Hickl et al. reference logically would not have commended itself to an inventor's attention in considering, as a whole, ways to provide a defroster heater that defrosts an evaporator of a refrigeration device that avoids too much or too little heat being supplied, thereby reducing unnecessary energy consumption. The Hickl et al. reference has absolutely nothing to do with solving the problem of reducing unnecessary energy consumption for a defroster heater that defrosts an evaporator of a refrigeration device, as in the present invention as a whole.

For at least these reasons, the subject matter of the Hickl et al. reference logically would not have commended itself to an inventor's attention in considering his or her invention as a whole, and therefore, the Hickl et al. reference does not qualify as analogous art.

Even assuming *arguendo*, that the Hickl et al. reference would qualify as analogous art, Appellants respectfully submit that one of ordinary skill in the art would not have had an apparent reason to combine the disclosure of the Hickl et al. reference with the disclosure of the Zangari et al. reference and the Chodacki et al. reference to arrive at the claimed invention as a whole. Moreover, the Office Action does not establish an adequate rationale for making such a combination.

The Zangari et al. reference is concerned with providing a frosting cooler that creates and maintains frost on cold products, thereby to provide a visual manifestation of the cold condition of the beverage. See Abstract.

In stark contrast, the Hickl et al. reference is concerned with the completely different and unrelated field of electric igniters for initiating combustion of a fuel air mixture in a burner which produces heat in heating system that uses gas, and particularly to an electric igniter for both a 120 V system and a 230 V system.

One of ordinary skill in the art would not have had an apparent reason to combine the features of an electric igniter for initiating combustion of a fuel air mixture in a burner which produces heat in heating system that uses gas for both a 120 V system and a 230 V system, as taught by the Hickl et al. reference, with a frosting cooler that creates and maintains frost on cold products, thereby to provide a visual manifestation of the cold condition of the beverage, as taught by the Zangari et al. reference.

Appellants respectfully request reversal of this rejection.

(8) CONCLUSION

In view of the foregoing discussion, Appellants respectfully request reversal of the Examiner's rejections.

Respectfully submitted,

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CLAIMS APPENDIX

1-11 (canceled).

12. (Rejected) A method for operating a defroster heater that defrosts an evaporator of a refrigeration device, comprising:

recording a voltage amplitude of a supply voltage for the defroster heater;

generating a pulsed supply current for said defroster heater, a pulse-duty ratio of the pulsed supply current based upon said recorded voltage amplitude; and

supplying said defroster heater with said pulsed supply current, for a fixed heating interval.

13. (Rejected) The method according to claim 12, further comprising generating said pulse-duty ratio as a decreasing step function of said recorded voltage amplitude.

14. (Rejected) The method according to claim 13, further comprising forming at least two discrete values for said decreasing step function in a predetermined permissible range of fluctuation of said voltage amplitude.

15. (Rejected) The method according to claim 13, further comprising dividing a value range of said voltage amplitude into a plurality of intervals, for each interval of the plurality of intervals assigning a fixed pulse-duty ratio and providing a ratio of upper to lower limit of said each interval of between 1.1 and 1.2.

16. (Rejected) The method according to claim 13, further comprising assigning a pulse-duty ratio of 1 to a voltage amplitude below at least 150 VAC.

17. (Rejected) The method according to claim 13, further comprising assigning a pulse-duty ratio of 1 to a voltage amplitude below at least 165 VAC.

18. (Rejected) The method according to claim 12, wherein the fixed heating interval includes a substantial number of cycles of an alternating current provided by the voltage supply.

19. (Rejected) A refrigeration device, comprising:

an integrated defroster heater for defrosting an evaporator;

a voltage supply coupled to said defroster heater;

a recording circuit coupled to said voltage supply for recording a voltage amplitude supplied to said defroster heater and for generating a control signal having a pulse-duty ratio that is based upon the recorded voltage amplitude; and

a circuit breaker activated by said control signal for pulsing a supply current fed to said defroster heater for a fixed heating interval.

20. (Rejected) The refrigeration device according to claim 19, wherein said pulse-duty ratio is generated as a decreasing step function of said recorded voltage amplitude.

21. (Rejected) The refrigeration device according to claim 20, wherein said step function has at least two discrete values.

22. (Rejected) The refrigeration device according to claim 20, wherein said decreasing step function has three or more discrete values.

23. (Rejected) The refrigeration device according to claim 20, wherein a value range of said voltage amplitude is divided into a plurality of intervals, each interval of the

plurality of intervals has a fixed pulse-duty ratio assigned, and the ratio from upper to lower limit of said each interval is between 1.1 and 1.2.

24. (Rejected) The refrigeration device according to claim 19, wherein said recording circuit assigns a voltage amplitude below 150 VAC a pulse-duty ratio of 1.

25. (Rejected) The refrigeration device according to claim 19, wherein said recording circuit assigns a voltage amplitude below 165 VAC a pulse-duty ratio of 1.

26. (Rejected) The refrigeration device according to claim 19, wherein the fixed heating interval includes a substantial number of cycles of an alternating current provided by the voltage supply.

EVIDENCE APPENDIX

None

RELATED APPEALS APPENDIX

None